Alg. 2 Warm Up #13-4

Factor completely:

1. $6x^2y + 18x^5y^2$
2. $3x^2 - 21x + 30$
3. $6x^2 - 54$
4. $2x^2 + x - 15$
5. $25x^2 - 16$
6. $4x^2 + 12x + 9$

HW Questions:

Review & Preview

4-40. Solve each of the following systems algebraically. What do the solutions tell you about each system? Visualizing the graphs may help with your description.

a. $y = 3x - 5$
$y = -2x - 15$

b. $y - 7 = -2x$
$4x + 2y = 14$

c. $y = 2(x+3)^2 - 5$
$y = 14x + 17$

d. $y = 3(x-2)^2 + 3$
$y = 6x - 12$

4-41. Solve each equation below. Think about rewriting, looking inside, or undoing to simplify the process.

a. $3(y+1)^2 - 5 = 43$

b. $\sqrt{1-4x} = 10$

c. $\frac{6y-1}{y} - 3 = 2$

d. $\sqrt[3]{1-2x} = 3$

4-42. This problem is a checkpoint for writing equations for arithmetic and geometric sequences. It will be referred to as Checkpoint 4A.

a. Write an explicit and ~~recursive rule~~ for $t(n) = 1, 4, 7, 10, \ldots$ $d=3$ $t(n)=3n-2$

b. Write an explicit and ~~recursive rule~~ for $t(n) = 3, \frac{3}{2}, \frac{3}{4}, \frac{3}{8}, \ldots$ $t(n)=6\left(\frac{1}{2}\right)^n$

In parts (c) and (d), write an explicit rule for the sequence given in the $n \to t(n)$ tables.

r^2

c. An arithmetic sequence

n	$t(n)$
0	24
1	17
2	
3	3
4	

$+d$ $+d$

$17+2d=3$
$2d=14$
$d=-7$

$t(n)=-7n+24$

d. A geometric sequence

n	$t(n)$
0	
1	
2	7.2
3	8.64
4	

$\frac{7.2r}{7.2}=\frac{8.64}{7.2}$

$r=1.2$

$t(n)=5(1.2)^n$

e. If an arithmetic sequence has $t(7)=1056$ and $t(12)=116$, what is $t(4)$?

Linear

$(7, 1056)$
$(12, 116)$

$d=\frac{1056-116}{7-12}$

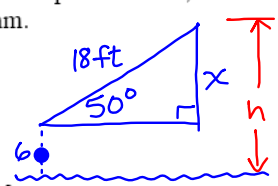
$=-188$

$y-116=-188(x-12)$

$y=-188x+2256$
$+116$

$t(n)=-188n+2372$

4-43. Wet World has an 18-foot-long water slide. The angle of elevation of the slide (the angle it forms with a horizontal line) is 50°. At the end of the slide, there is a 6-foot drop into a pool. After you climb the ladder to the top of the slide, how many feet above the water level are you? Draw a diagram.



$\sin 50=\frac{x}{18}$

$x=18(\sin 50°)$

$h=x+6$

4-44. Find the slope and y-intercept of each line below.

a. $y=-\frac{6}{5}x-7$

b. $3x-2y=10$

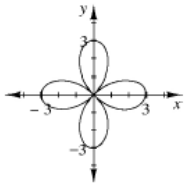
c. The line that goes through the points $(5, -2)$ and $(8, 4)$.

$m=\frac{-2-4}{5-8}=\frac{-6}{-3}=2$

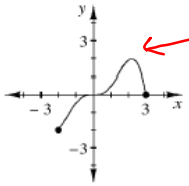
$y+2=2(x-5)$

4-45. Examine the graph of each relation below. For each part below, decide if the relation is a function and then state the domain and range.

a.



b.



highest point at $y=2$

dom: $-2 \le x \le 3$

range: $-2 \le y \le 2$

4-46. Solve the system of equations at right.

$$2^{(x+y)} = 16$$
$$2^{(2x+y)} = \frac{1}{8}$$

$2^{(x+y)} = 2^4$

① $-1(x+y=4)$

$-7+y=4$

$y=11$

$2^{2x+y} = 2^{-3}$

② $2x+y=-3$

$-x-y=-4$

$x=-7$

$\boxed{\begin{array}{l} x=-7 \\ y=11 \end{array}}$

$(-7, 11)$

CP's: 4- #47 ---> 49a (skip 49b) (yellow)

4.1.4 How can I use systems?

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Using Systems of Equations to Solve Problems

You have developed several strategies for solving equations and systems of equations. You have also focused on the meaning of a solution. In this lesson, you will have the opportunity to see how your strategies can be used in everyday contexts. You will expand your understanding of solutions by applying them to these situations. As you work today, use the questions below to help stimulate mathematical conversations:

How can we model this situation with equations?

What does this solution tell us?

How can we solve it?

Are there any other strategies that could be useful?

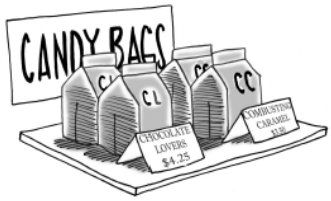
4-47. HOW TALL IS HAROLD?

Jamal and Dinah were still eating lunch as they came into Algebra 2 class. Someone had left a book on the floor and they both tripped. As they each hit the floor, the food they were carrying went flying across the room directly toward Harold, who was showing off his latest dance moves.

As Jamal and Dinah watched in horror, Jamal's cupcake and Dinah's sandwich splatted right on top of Harold's head! Jamal's cupcake flew on a path that would have landed on the floor 20 feet away from him if it had not hit Harold. Dinah's sandwich flew on a path that would have landed on the floor 24 feet away from her if it had not hit Harold. Jamal's cupcake flew 9 feet high, while Dinah's sandwich reached a height of 6 feet, before hitting Harold.

How tall is Harold? Show your solution in as many ways as you can.

4-48. Write a system of equations to fit the situation below. Then solve the system using as many strategies as you can. How many solutions are possible?



Your math class wants to collect money for a field trip, so it decides to sell two kinds of bags of candy. The Chocolate Lover's Bag costs $4.25 for five chocolate truffles and two caramel turtle candies. The Combusting Caramel Bag costs $3.50 for eight caramel turtle candies and two chocolate truffles. How much does each chocolate truffle and caramel turtle candy cost?

4-49. Lucky you! You are a new college graduate and you have already been offered two jobs. Each job involves exactly the same tasks, but the salary plans differ, as shown below.

- Job A offers a starting salary of $52,000 per year with an annual increase of $3,000.
- Job B starts at $36,000 per year with a raise of 11% each year.

a. Under what conditions would Job A be the better choice? When would Job B be the better choice? Use graphs, tables, and equations to help you justify your answer.

b. How could you change this problem slightly so that Job B is always the better choice? How could you change it so that Job A is always better? If it is not possible for Job A or Job B always to be a better choice, explain why not.

Classwork Week 13
Warm up
4- # 1 ---> 3
4- #15 ---> 18
4- #36, 37
4- #47--->49a
(yellow)

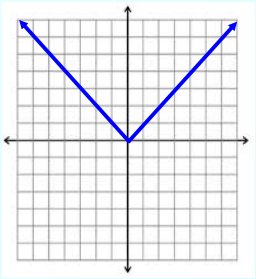
HW: 4-

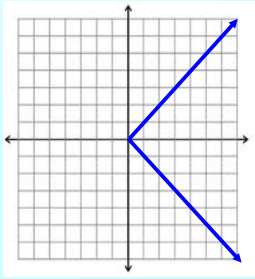
51 ---> 57

Graphs from 4- #34, to use on #55:

a)

$y=|x|$



b)

$x=|y|$